BOARD REVIEW
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Part II COMPONENTS- ENDO
✓ Clinical Diagnosis, Case Selection, Treatment Planning, and Pt management 14
✓ Basic Endodontic Treatment Procedures 8
✓ Procedural Complications 3
✓ Traumatic Injuries 2
✓ Adjunctive Endodontic Therapy 1
✓ Post-Treatment Evaluation 2

✓ Approximately 60% of the questions are repeats from previous exams

BOARD REVIEW
✓ PULP BIOLOGY
✓ TOOTH ANATOMY
✓ PULP DIAGNOSIS
✓ ROOT CANAL THERAPY
✓ ENDODONTIC SUCCESS-FAILURE
✓ MISCELLANEOUS

PULP BIOLOGY
PULP COMPOSITION

In the normal dental pulp, which of the following histologic features is (are) the least likely to appear:
A) Cell-free zone of Weil
B) Palisade odontoblastic layer
C) Lymphocytes and plasma cells
D) Undifferentiated mesenchymal cells

Which of the following cells are characteristic of chronic inflammation of the dental pulp:
a) Neutrophils
b) Eosinophils
c) Lymphocytes
d) Macrophages
e) Plasma cells
1) a,b,c & d  2) a,b, & d only  3) a,b, & e only  4) a, c & e  5) c, d & e only

AGING OF PULP

Aging of the pulp is evidenced by an increase in fibrous elements

PULPAL NERVOUS SYSTEM

Efferent nerves found in the dental pulp are:
- sympathetic post ganglionic fibres

HYDRODAMIC THEORY

TYPES OF DENTIN

- PRIMARY
- SECONDARY
- TERTIARY
  - REACTIONARY
  - REPARATIVE
- TUBULAR
- PERITUBULAR
- INTERTUBULAR
- GLOBULAR
- INTERGLOBULAR
- SCLEROTIC
ACCESSORY CANALS

✔ Studies indicated that patent blood vessels course in lateral or accessory canals connecting the coronal and/or radicular pulp with the PDL.
✔ They appear to be distributed at any level of the root as well as on the floor of the pulp chamber.
✔ Distribution of lateral canals
  – 17% in the apical third
  – 8.8% in the middle third
  – 1.6% at the coronal portion

ACCESSORY CANALS

✔ A non-carious tooth with deep periodontal pockets that do not involve the apical third of the root has developed an acute pulpitis. There is no history of trauma other than a mild prematurity in lateral excursion. What is the most likely explanation for the pulpitis?

1) Normal mastication plus toothbrushing has driven microorganisms deep into tissues with subsequent pulp involvement at the apex.
2) During a general bacteremia, bacteria settled in this aggravated pulp and produced an acute pulpitis.
3) Repeated thermal shock from air and fluids getting into the deep pockets caused the pulpitis.
4) An accessory pulp canal in the gingival or the middle third of the root was in contact with the pockets.

APICAL FORAMEN

✔ Initial instrumentation in endodontic tx is done to:
  a) Radiographic apex
  b) Dentino-enamel junction
  c) Cemento-dentinal junction
  d) Cemento-pulpal junction

CEMENTUM

✔ CELLULAR = APICAL THIRD OF ROOT
✔ ACELLULAR
**MANDIBULAR 1st MOLAR**

- Approximately what percent of mandibular first molars exhibit two distal canals?
  1) 0
  2) 0.1
  3) 0.3
  4) 0.6
  5) 0.75

**MAX 1st MOLAR**

- Buccal hook palatal root
- 4 canals
- MB1 (MB); MB2 (ML)
- 74% 2nd canal
  - Half have a separate foramen
- The most common curvature of the palatal root of the maxillary first molar is to the:
  1) facial
  2) mesial
  3) distal
  4) lingual

**MAX FIRST BICUSPID**

- Easiest tooth to perforate
- Mesial concavity
- Canal number: 90% 2, 10% 1
- Radiograph
- SLOB / Clark’s Rule / Buccal Object Rule
- Cone Shift

*The teeth that are easiest to perforate by slight mesial or distal deviation from proper angulations of a bur are mandibular incisors and maxillary first premolars.*

**MAX LATERAL INCISOR**

- Possible severe distal curvature in apical 1/3
- Curve may have a palatal aspect to it

**MAX LATERAL INCISOR**

- Which of the following teeth are the least likely to have more than 1 canal
  1) Maxillary lateral incisors
  2) Mandibular lateral incisors
  3) Mandibular first premolars
  4) Maxillary second premolars
  5) Mandibular second premolars
MOST CONSISTENT ROOT CANAL ANATOMY

- MAXILLARY CUSPID

DIAGNOSIS

- PULP
- PERIRADICULAR
- ENDO- PERIO
- REFERRED PAIN
- SINUS TRACTS
- CYST AND GRANULOMA
- RESORPTION
- NON-ODONTGENIC
- ANKYLOSIS

PULP DIAGNOSIS

- NORMAL
- REVERSIBLE PULPITIS
- IRREVERSIBLE PULPITIS
- NECROTIC

PULP DIAGNOSIS

- Which is most likely to cause pulp necrosis:
  1) Intrusion
  2) Extrusion
  3) Lateral displacement
  4) Concussion

- Prolonged, unstimulated night pain suggests which of the following conditions of the pulp?
  1) Pulp Necrosis
  2) Mild hyperemia
  3) Reversible pulpitis
  4) No specific condition

PERIRADICULAR DIAGNOSIS

- ACUTE PERIRADICULAR PERIODONTITIS
- ACUTE APICAL ABSCESS
- CHRONIC PERIRADICULAR PERIODONTITIS
- CHRONIC PERIRADICULAR ABSCESS
  - SUPPURATIVE PERIRADICULAR PERIODONTITIS
- SUBACUTE PERIRADICULAR PERIODONTITIS
- NORMAL
PERIRADICULAR DIAGNOSIS (contd)

- How to differentiate between acute apical abscess and acute periodontal abscess:
  - Pulp vitality test
  - Percussion is a dental diagnostic procedure used in determining whether periodontitis exists.

- The pathognomic symptom of chronic apical periodontitis is:
  1) Swelling
  2) Intermittent pain
  3) Tenderness to palpation
  4) Tenderness of percussion
  5) None of the above

Radiographs reveal a deep, distal carious lesion on the suspect tooth. The apical periodontal ligament appears normal most probable diagnosis for the condition of the pulp and the apical periodontal ligament is:

1) Vital pulp
2) Necrotic pulp
3) Irreversibly inflamed pulp
4) Inflamed apical periodontal ligament
5) Uninflamed apical periodontal ligament

- PRIMARY ENDO
- PRIMARY PERIO
- PRIMARY ENDO – SECONDARY PERIO
- PRIMARY PERIO – SECONDARY ENDO
- TRUE COMBINED LESION
- PULP TEST - PROBE

ENDO PERIO

ENDO PERIO
ENDO PERIO

REFERRED PAIN

SITE OF PAIN – WHERE IT IS FELT
- LOCATION
SOURCE OF PAIN – ORIGIN
REFERED PAIN – THE SITE AND
SOURCE ARE NOT THE SAME

SINUS TRACT

Presence of sinus tract
- The cone should track back to the source of infection
- This will demonstrate which root of the molar is affected

SINUS TRACT

1. Conventional RCT, antibiotics not needed.
2. Will heal in 2-4 weeks after conventional RCT
3. If present, post RCT do apical surgery with retrofill (answer for the board)

LATERAL PERIODONTAL CYST

- Vitality test
- Not of pulpal origin

GLOBULOMAXILLARY CYST

- Mythical lesion allegedly located between maxillary lateral incisor and cuspid
- Vitality test
GRANULOMA

Periapical Inflammation

- An extension of pulpal inflammation
- Periapical tissues will become involved before total pulpal necrosis
- Bacteria and inflammation by products leak through AF and start inflammation

APICAL CYST

NON-ODONTOGENIC

CONDENSING OSTEITIS

- Confirm vitality
- History of tooth or restoration
- RCT vs No RCT

CEMENTOMA

- Vitality test
- Radiolucent/opaque lesion
- Calcifying fibroma
- Predominant location lower anteriors
- Ethnic link observed (Predominantly among African-American)
ANKYLOSIS

Which is the most important sign of Ankylosis:
1) Dull sounding
2) Resonant
3) Cessation of eruption
4) Cross bite

BACTERIA

Kakehashi, Stanley, Fitzgerald
1965
Bacteria are the problem

INFECTION

INFECTION SEVERITY

RESISTANCE OF HOST
VIRULENCE
POPULATION/NUMBER

CHRONIC INFLAMMATION OF THE PULP

LYMPHOCYTES
MACROPHAGES
PLASMA CELLS

FATE OF EXTRARADICULAR INFECTION

SOME PROBLEMS SUCH AS ACTINOMYCOSES ARE EXTRARADICULAR AND MAY REQUIRE SURGERY TO RESOLVE THE INFECTION.
TRUE CYSTS
OSTEOMYELITIS
BIOPSY AND CULTURE
WHY DO WE HAVE A PROBLEM

BACTERIA!!!

CRITERIA for SUCCESS

✔ ELIMINATE BACTERIA
✔ PROTECT AGAINST BACTERIA

Severity of the course of a periapical infection depends upon the:
1) Resistance of the host
2) Virulence of the organism
3) Number of organisms present
4) All of the above
5) Only 1 and 2

CRITERIA for SUCCESS

✔ What is the radiographic sign of successful pulpotomy in a permanent tooth?
1) Open apex
2) That the apex has formed
3) Loss of periapical lucency
4) No internal resorption

RESORPTION

PHYSIOLOGIC OR PATHOLOGIC LOSS OF TOOTH STRUCTURE

SURFACE RESORPTION

✔ A PHYSIOLOGIC PROCESS CAUSING SMALL SUPERFICIAL DEFECTS IN THE CEMENTUM AND DENTIN THAT UNDERGO REPAIR BY DEPOSITION OF NEW CEMENTUM
✔ USUALLY NOT DETECTABLE ON A RADIOGRAPH

SURFACE RESORPTION
PRESSURE RESORPTION

- ORTHODONTIC TOOTH MOVEMENT
- TOOTH ERUPTION
- TUMORS

INFLAMMATORY RESORPTION

- BACTERIA
- EXTERNAL
- INTERNAL
- PATHOLOGIC LOSS OF TOOTH STRUCTURE RESULTING IN A DEFECT IN THE ROOT AND ADJACENT BONE
INFLAMMATORY RESORPTION

EXTERNAL REPLACEMENT RESORPTION

ANKYLOSIS
TRAUMA
IDIOPATHIC
PATHOLOGIC LOSS OF TOOTH STRUCTURE WITH THE INGROWTH OF BONE INTO THE DEFECT
FUSION OF BONE TO CEMENTUM OR DENTIN

EXTERNAL REPLACEMENT RESORPTION

Idiopathic
Extracanal invasive resorption
Cervical resorption - most common name
External invasive resorption

ETIOLOGY OF RESORPTION

UNKNOWN
TRAUMA
ORTHODONTICS
INTERNAL BLEACHING
BACTERIA

EXTERNAL RESORPTION

SURFACE
PRESSURE
INFLAMMATORY
REPLACEMENT
INFLAMMATORY PERIRADICULAR LESIONS ALWAYS RESULT IN RESORPTION OF BOTH BONE AND TOOTH

EXTERNAL INVASIVE RESORPTION

A
B
CERVICAL RESORPTION

INTERNAL RESORPTION

- SURFACE
- INFLAMMATORY
- NECROTIC TEETH ALWAYS HAVE INTERNAL INFLAMMATORY RESORPTION
- PERFORATION

INTERNAL RESORPTION

DIFFERENTIATION OF INTERNAL AND EXTERNAL RESORPTION

- INTERNAL
  - REGULAR
  - ROUND
  - CENTERED, USE SLOB RULE
- EXTERNAL
  - IRREGULAR, MOTH EATEN
  - OFF CENTER, USE SLOB RULE
INTERNAL RESORPTION

- INTERNAL RESORPTION
- ENDODONTIC TREATMENT
- MAY BE DIFFICULT
  - PERFORATION
  - APICAL

EXTERNAL RESORPTION

- EXTERNAL INFLAMMATORY RESORPTION
  - CALCIUM HYDROXIDE
  - CONTROL INFECTION
  - FILL CANALS

TREATMENT

- EXTERNAL INFLAMMATORY RESORPTION
  - CALCIUM HYDROXIDE
  - CONTROL INFECTION
  - FILL CANALS

TREATMENT CONTINUED

- AVULSION
  - GUARDED TO HOPELESS

- IDIOPATHIC
  - PROGNOSIS DEPENDS ON EXTENT AND LOCATION
**ACCESS**

1. Pulp is exposed.
2. Resorption stops when pressure is discontinued.

**Pathologic**
1. There is no periapical space in the receptacle site.
2. Molars of denture are irregluar.
3. Canal maintains original form.
4. Pulp is nonexposed.
5. Removal of the roof of the pulp chamber.

**Irrigants**
1. No treatment is necessary.
2. Excellent when exothermic pressure is discontinued.

**Files**
1. Root canal irrigation (RCI).
2. No root canal therapy (RCT).
3. Root canal examination (RCX).
4. Root canal therapy (RCT).
5. Root canal therapy (RCT).
6. Root canal therapy (RCT).

**Sealers**
1. Root canal therapy (RCT).
2. Root canal therapy (RCT).
3. Root canal therapy (RCT).
4. Root canal therapy (RCT).
5. Root canal therapy (RCT).
6. Root canal therapy (RCT).

**Gutta Percha**
1. Root canal therapy (RCT).
2. Root canal therapy (RCT).
3. Root canal therapy (RCT).
4. Root canal therapy (RCT).
5. Root canal therapy (RCT).
6. Root canal therapy (RCT).

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**Internal resorption**
1. Bulbous enlargement of pulp chamber or canal.
2. Bulbous enlargement of pulp chamber or canal.

**Extracanial invasive resorption**
1. Bulbous enlargement of pulp chamber or canal.
2. Bulbous enlargement of pulp chamber or canal.

**The objectives of the access preparation are to:**
1. Provide unobstructed visibility into all canals.
2. Allow files to be passed into each canal without binding on the walls of the access preparation (straight line access to avoid ledge).
3. Allow obturation instruments to fully enter each canal without binding on the walls of the access preparation.
4. Include removal of all caries and defective restorations.
5. Make possible the removal of all pulp tissue.
ACCESS

- Oval
- Triangular
- Trapezoidal

Mandibular molar with 4 canals.

ACCESS

- Which of the following can cause a ledge formation:
  1) Infection
  2) Remaining debris within the canal
  3) No straight line access

- A mandibular molar has 4 canals. How should the access opening be:
  1) Round
  2) Oval
  3) Trapezoidal
  4) Triangular

IRRIGANTS

- EDTA
- Sodium Hypochloride

EDTA

- EDTA - 16-20% solution
- Chelating agent
- Decalcifies dentin
- Removes smear layer

SODIUM HYPOCHLORITE

- 5.25% NaOCl
- Dissolves organic material
- Kills bacteria
- Sterilize GP. (wipe with alcohol afterwards)
PRECURVE FILES

- Precurve all stainless steel files prior to placement in a canal
- Precurving files is indicated
  1 for files sizes #35 and over.
  2 in canals that are even slightly curved.
  3 as a way to negotiate past canal obstructions.
  4 All of the above

  5 Only (1) and (2) above
  6 Only (2) and (3) above

SEALERS

- Zinc oxide eugenol – Kerr Sealer
- Resin – AH26
- Paste fill

Which of the following represents the basic constituents of most root canal sealers:

Answer: Zinc oxide

Other Root Canal Therapies

- Apexification
- Pulpotomy
- Apexogenesis
- Apexectomy
- Pulp Cap

APEXIFICATION
APEXIFICATION

✔ NECROTIC IMMATURE TOOTH
✔ CONFIRM DIAGNOSIS
✔ ACCESS - DEBRIDMENT
✔ SODIUM HYPOCHLORITE - INSTRUMENTATION
✔ PLACE CALCIUM HYDROXIDE
✔ PLUGGER, LENTULO SPIRAL, COMPACTOR, MESSING GUN

✔ What kind of procedure should be performed on a tooth with necrotic pulp and unfinished root tip

- apexification

DIAGNOSE ACCESS DEBRID INSTRUMENT DISSOLVE

APEXIFICATION

APEXIFICATION
APEXIFICATION

APEXOGENESIS

A vital pulp therapy procedure performed to encourage continued physiological development and formation of the root end. This term is frequently used to describe vital pulp therapy performed to encourage the continuation of this process.

APEXOGENESIS

- What is best sign for success of apexogenesis
  - Continuous completion of apex

APEXOGENESIS

MTA – Mineral Trioxide Aggregate

- Dr Mahmoud Torabinejad, Loma Linda
- Modified Portland Cement
- Bismuth oxide
- Very good seal
- Expands slightly when sets with moisture
- Long setting time
Uses for MTA
- Pulp cap
- Perforation repair
- Pulpotomy
- Apexification
- Apical barrier

Other products
- White MTA
- SOC – Silicate Oxide Compound
- USC – Universal Silicate Cement

PULPOTOMY
- Pulp cap
- Partial/Cvek pulpotomy
- Pulpotomy
- Deep pulpotomy
- Pulpectomy

WHY PULP CAP ???
- MAINTAIN NORMAL PULP VITALITY
- RETURN PULP TO NORMAL
- AVOID ENDODONTIC TREATMENT
- AVOID EXTRACTION
- AVOID EXTENSIVE TREATMENT
- POSTPONE ENDODONTIC TREATMENT
PULP CAP DIRECT

- Pulp capping and pulpotomy can be more successful in newly erupted teeth than in adult teeth because:
  1. a greater number of odontoblasts are present
  2. incomplete development of nerve endings
  3. open apex allows for greater circulation

Calcium hydroxide is generally the material of choice in vital pulp capping because:
1) Encourages dentin bridge formation
2) Is less irritating to the pulp
3) Seals the cavity better
4) Adheres well to dentin

To ensure better thermal and protective insulation of the pulp during a capping procedure, Ca(OH)₂ should be covered with a stronger base.

Pulp cap traumatic exposure

INDIRECT PULP CAP
REPLANTATION

- When both surgery and retreatment are difficult, then extraction and replantation may be the treatment of choice.

ENDODONTIC SUCCESS – FAILURES
FAILURE – SUCCESS REASONS

- Poor condensation, incomplete fill
- Inadequate disinfection
- The most frequent cause of failure in endodontics is
  1. split roots.
  2. root perforation.
  3. Incomplete obturation.
  4. separated instruments.
  5. filling beyond the apex.

TRAUMA – FRACTURES

TRAUMA

- AVULSION: Milk, replant ASAP, open apex, splint 7-10 days, endo tx 1wk, Ca(OH)_2, resorption, replacement, inflammatory
- CONCUSSION: least damaging
- LUXATION: pulp necrosis likely, 60% immature apex teeth become nonvital
  Intrusive luxation, necrosis, ankylosis
- FRACTURES

TRAUMA

- An 8-year-old boy received a traumatic injury to a maxillary central incisor. One day later, the tooth failed to respond to electric and thermal vitality tests. This finding dictates
  1. pulpectomy.
  2. apexification.
  3. calcium hydroxide pulpotomy.
  4. delay for the purpose of re-evaluation.

TRAUMA

- Intrusion

  Management
  - Immature teeth
    - A tooth with an open apex is likely to re-erupt spontaneously
    - Monitor the progress of re-eruption
    - No treatment is needed if tooth re-erupts into normal position and there is no evidence of pulpal involvement
  - Mature teeth
    - Intruded mature teeth need to be repositioned immediately
    - Initial extrusion will be made orthodontically or surgically depending on degree of intrusion

  Prognosis
  - High risk of pulp necrosis; Endodontic therapy is often indicated; possibility of resorption shows the need to follow up

  Recalls
  - Evaluate 4-6 weeks after trauma and after 6 months; after that yearly recall are indicated
**Root Fractures**

- Limited to fractures involving roots only; cementum, dentin, and pulp

**FRACTURED ROOTS**

- **CORONAL THIRD:** ENDO AND ORTHO EXTRUSION
- **MIDDLE THIRD:** SPLINT AND OBSERVE
- **APICAL THIRD:** ENDO TO THE FRACTURE LINE IF NECROTIC, APEX USUALLY REMAINS VITAL

**VERTICAL ROOT FRACTURES**

- Failure of tooth with recently placed post and core: Vertical root fracture
- Majority of vertical root fractures of endo tx teeth result from *condensation forces* during gutta-percha filling
- Diagnose with peri-probe, narrow periodontal pocket width
- Tx is extraction

**SEPARATED INSTRUMENTS**

- **APICAL 3rd & VITAL** — fill and observe, temporize, no permanent restoration for 3-6 months
- **NON-VITAL** — refer to endodontist
- **MIDROOT** — refer to endodontist
- In all cases inform patient
SURGERY AND HEALING

INDICATIONS FOR SURGICAL ENDODONTIC TREATMENT
- Failing RCT where it is not possible (or practical) to retreat
- Disassemble?
- Post? Is it practical??

SURGICAL ENDODONTIC TREATMENT
- A patient has a draining sinus tract apical to a maxillary lateral incisor. The tooth, which is restored with a post and crown, received a root canal filling and apicoectomy one year ago. Radiographically, the tooth measures 19 mm in length. Adjacent teeth respond normally to pulp testing. The patient is asymptomatic. Which of the following is the most acceptable treatment?
  1. Retreat and refill the canal with gutta-percha.
  2. Retreat and refill the canal, then perform an apicoectomy.
  3. Retreat by surgery using a retrofill amalgam.
  4. No treatment is necessary unless the patient develops symptoms.

APICOECTOMY
- REVERSE FILL
- CURETTAGE

APICOECTOMY EXPECTED HEALING TIME
- 3-6 months for radiographic evidence
- Asymptomatic
- 2-4 weeks sinus tract gone

HEALING
- BONE - yes
- PDL - yes
- DENTIN - no
- CEMENTUM - yes
- ENAMEL - no

Prognosis of a tooth with a broken instrument located 3 mm from the apex is probably best if the tooth has a
1) vital pulp with a periapical lesion.
2) vital pulp without a periapical lesion.
3) necrotic pulp with a periapical lesion.
4) necrotic pulp without a periapical lesion.
**HEALING**

- Severity of the course of a periapical infection depends upon the:
  1) Resistance of the host
  2) Virulence of the organism
  3) Number of organism present
  4) All of the above
  5) Only 1 and 2

- What is the radiographic sign of successful pulpotomy in a permanent tooth?
  1) Open apex
  2) That the apex has formed
  3) Loss of periapical lucency
  4) No internal resorption

- Once the root canal is obturated, what usually happens to the organism that had previously entered periapical tissues from the canal:
  a) They persist and stimulate formulation of granuloma
  b) They are eliminated by the natural defenses of the body
  c) They re-enter and re-infect the sterile canal unless periapical surgery is performed
  d) They will have been eliminated by various medicaments that were used in the root canal

**BLEACHING**

- INTERNAL BLEACHING
- WALKING BLEACH
- DO NOT USE STRONG, 30%, H2O2 (Superoxol) – RESORPTION
- SODIUM PERBORATE
- Need to put cement barrier between gutta percha and bleaching material

**TOOTH DISCOLORATION**

- PULP NECROSIS
- RESTORATIVE MATERIALS
- SYSTEMIC MEDICATIONS
  - FLUORIDE
  - TETRACYCLINE
- GENETIC
- ENVIRONMENTAL
A patient of record calls late Saturday night because of severe, throbbing pain aggravated by "heat, biting and touching" in a mandibular premolar. What procedure is recommended?

1. Instruct the patient to apply ice intermittently, take aspirin, and call Monday for an appointment.
2. See the patient at the office and initiate endodontic treatment.
3. See the patient at the office, remove the carious dentin and place a sedative zinc oxide-eugenol cement.
4. Prescribe an analgesic and refer the patient to an endodontist.
5. Refer the patient to the hospital oral surgery department for extraction.
SYSTEMIC DISEASES

- Premedication - RHEUMATIC FEVER
- AHA Guidelines

OSTEOMYELITIS

- Pt has large carious lesion, toothache, submandibular facial swelling, fever of 102°F. Continuous exudate through gingival sulcus, moth eaten radiolucent appearance.
- Most probable diagnosis: Acute osteomyelitis

MISCELLANEOUS

- Endodontically treated posterior teeth are more susceptible to fracture than untreated posterior teeth. The best explanation for this is:
  1. moisture loss.
  2. loss of root vitality.
  3. plastic deformation of dentin.
  4. destruction of the coronal architecture.
  5. increased susceptibility of the enamel to fracture.

TEMPORARY RESTORATION

- ZOE is a good temporary restoration because:
  1) less irritant
  2) Increased strength
  3) Good seal
  4) Antibacterial

PULP TEST

- Which of the following is least useful in children:
  1) Percussion
  2) Palpation
  3) Electric pulp test
  4) Thermal test

SLOB Rule

- On a radiograph, the facial root of a maxillary first premolar would appear distal to the lingual root if the:
  1) vertical angle of the cone were increased.
  2) vertical angle of the cone were decreased.
  3) x-ray head were angled from a distal position relative to the premolar.
  4) x-ray head were angled from a mesial position relative to the premolar.
SLOB Rule

A radiograph shows a lucency that does not appear to move with application of the Clarke’s Principle/Rule. Where is the lucency situated?
1) No way of telling
2) Lingual
3) In the canal
4) Buccally

CONCLUSIONS

- Try and maintain pulp vitality
- Young pulps respond better than old pulps to trauma
- Disinfect
- Seal

GOOD LUCK